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NEW AND LITTLE-KNOWN WESTERN BEES

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The species recorded below are of special interest for various reasons. It is astonishing to find a new *Coelioxys* of large size in the vicinity of Boulder. This and other species bred by Mr. Hicks show how it is possible to obtain in this way insects which are rarely found in general collecting. Either they are rare, or their habits are such that they do not easily fall into the net.

The holotypes of all the new species are in The American Museum of Natural History.

Andrena scotoptera, new species

Female.—Length about 12 mm., anterior wing 10; black, with the tarsi more or less brownish; head very broad, orbits slightly diverging below; mandibles ordinary; malar space obsolete; process of labrum large, truncate, not at all emarginate; clypeus shining, but densely and conspicuously punctured, with a smooth median line; antennae rather long for a female, black, third joint almost as long as next two together; facial foveae broad, whitish, separated from eye by a shining band; hair of head and thorax long and abundant, fulvous, becoming rich ferruginous above, and long red hairs at each side of face; mesothorax and scutellum very finely punctured, glistening but not polished ; area of metathorax without plicae, almost hidden by long hair; tegulae ferruginous; wings fuliginous, the apical margin not darker than the rest; stigma rather large, very dark reddish, hard to see in the dark wing; nervures light brown; basal nervure meeting nervulus; second cubital cell very large, quadrate, receiving recurrent nervure slightly beyond middle; legs with yellowish hair, the scopa of hind tibia entirely pale, tuft on hind knees very light reddish brown, hair on inner side of hind basitarsi light reddish fulvous; spurs pale reddish; abdomen above somewhat shining, but not polished, without bands, the depressions dullish, not shining; tergites extremely finely and closely punctured, the punctures just visible under a hand lens; second tergite in middle depressed more than a third, but much less than a half; caudal tuft clear red; sternites with very long pale fulvous fringes. The dark wings are strongly reddened.

Texas: Austin, March 24, 1933 (H. B. Parks, Jr.). Taken on willow. Received from Mr. H. B. Parks. Closely allied to *A. perplexa* Smith, which has been recorded from Texas, under the name *A. belfragei* Cresson. It is especially to be recognized by the fuliginous wings, those of *A. perplexa* being "subhyaline, their apical margins clouded," or as Cresson states for *A. belfragei*, "yellowish-hyaline, apex rather broadly

fuscous, subviolaceous." It also closely resembles *A. commoda* Smith, the *A. corni* Robertson, but the black antennae, bright red tegulae, somewhat narrower facial foveae, and less shining, not at all pruinose abdomen, are distinctive.

Protandrena mexicanorum (Cockerell)

Colorado: Crowley, Aug. 4, 1933 (Helen James). New to Colorado.

Emphoropsis birkmanni Cockerell

Mr. H. B. Parks has found this species near San Antonio, Texas, and sends the hitherto unknown male, which resembles the female but has the clypeus (except the usual black marks), a narrow stripe along lower edge of supraclypeal area, and lateral face marks, all very pale yellow. There are long black hairs at each side of face. The hair on the legs is black, a little pale at end of middle tibia. The pattern of the face marks is similar to that of *E. floridana* (Smith), but the clypeus is larger and longer.

Mr. Parks gives the following account of the habits of the species:

> This is one of the earliest flying of this general group of bees. Its flight seems to be of the same occurrence as the blooming of *Lupinus subcarnosus* Hooker, and *Aesculus pavia* Linnaeus. This period is about six weeks long and varies in the date of beginning from February 20 to March 15. I have never captured a specimen of this bee beyond the limits of the Carrizo sand deposit which crosses the southern boundary of Bexar County. The females collect pollen and nectar from both of the plants named. However, I have never captured a male on *Aesculus*. I have captured males on *Lupinus* and on *Hamosa nuttalliana* (DC) Rydberg. I suspect that more collecting would show that this species frequents all of the flowers blooming at that time which have long corolla tubes. The nests of this insect are tunnels driven into the walls of ravines generally in a place where the wall is protected by an overhanging tree. At the mouth of the tunnels a small tube is built which goes out about one-eighth of an inch and then turns downward some times at least one-half inch. Evidently these insects recognize their own nest from a distance, because when they come in or leave it is extremely hard to capture them. Those leaving can be captured by placing the net over the tunnels but holding the net the other way fails to catch any of the incoming bees.

It will be noted that the nest-building habits are like those of *Anthophora*.

Coelioxys hicksi, new species[1]

FEMALE.—Length about 15 mm., anterior wing 11; entirely black, including mandibles, antennae, tegulae, and legs; eyes very dark green, with very short hair; mandibles tridentate; face with thin whitish hair, forming a very thin pruinose covering on clypeus, from the lower margin of which project orange hairs; long white hair laterad of each antenna; clypeus convex, dullish, very finely sculptured, the lower margin straight and simple; front dull; vertex with very large irregular punctures; mesothorax practically bare, except some pale hair in front, its surface shining but not polished, with very strong well-separated punctures; spines of axillae very short; scutellum with very coarse and dense punctures, the margin broadly rounded; sides of metathorax with abundant pale, slightly tawny hair; mesopleura coarsely punctured, the punctures more or less in rows, and with pale hair; wings grayish hyaline, with a well-defined dusky outer margin; stigma and nervures black; basal nervure meeting nervulus; first recurrent nervure ending far from base of second cubital cell, the distance rather more than half of the length of intercubitus; spurs black; hind basitarsi with pale reddish hair on inner side; abdomen shining, with sparse punctures; first tergite with a large triangular patch of dense white hair on each side; tergites 2 to 4 with pure white hair-bands, broadened at sides, linear and almost evanescent in middle; tergites 2 and 3 with a broad oblique groove on either side of middle, not at all connected across the middle line; sixth tergite shining, with a fine keel running its whole length, at sides it is rather abruptly constricted, the apical portion obtuse and not turned up at end; apical sternite extending considerably beyond the tergite, narrow (but not excessively so), neither notched nor fringed; fourth sternite with rather strong, distinctly separated punctures of about the same size; fifth sternite dullish, without evident punctures, the apex slightly bidentate.

Colorado: Nederland, bred March 31 (in laboratory) from cells of *Megachile sapellonis* Cockerell (Chas. H. Hicks). Related somewhat to *C. alternata* Say, to which it runs nearest in Crawford's table, but easily separated by the large size and the structure of the sixth sternite.

The wood containing the *Megachile* nests was found at Nederland by Mr. W. O. Mitchell.

Coelioxys rudis, new species

FEMALE (type).—Length, 12 mm., or sometimes smaller; black, with the tegulae dark red, tibiae and tarsi bright chestnut-red, basal part of legs black, but femora with the apical half, more or less, red; eyes black, with very short hair; face densely covered with short white hair; clypeus densely and finely punctured, with a very delicate median raised line, lower margin straight and simple; top of head with dense, very coarse punctures all over; mesothorax and scutellum extremely coarsely punc-

[1]Since this paper was written, Professor Brues has published an interesting discussion on size in insects (Psyche, March, 1934). In the Palaearctic region there occur relatively gigantic forms of *Halictus*, which appear to have arisen by discontinuous variation (mutation). In North America there are certain large species of *Megachile* (*M. cockerelli, M. sapellonis*), which possess many distinctive characters other than size. Are we to suppose that *Coelioxys* has or had a tendency to produce large forms, which under ordinary circumstances would not survive, but that the existence of the large *M. sapellonis* made possible the establishment of a large type of *Coelioxys*? A detailed consideration of the size factor among bees would certainly give interesting results, but it would doubtless be found that various influences were involved, no simple or single explanation being sufficient.

tured; axillar spines long; anterior margin of mesothorax with white hair, failing in middle; a tuft of pure white hair in front of base of each axilla, and two transverse spots of white hair between mesothorax and scutellum; sides of thorax posteriorly with much white hair; wings hyaline, with the apical margin broadly clouded; second cubital cell receiving first recurrent nervure about twice as far from base as second from apex; front femora with a rather short, even fringe of white hair behind; abdomen shining, the punctures distinct but not dense; first tergite with a shining impunctate band subapically; second tergite with a complete deep transverse channel; margins of tergites 1 to 5 with even, pure white hair-bands; sixth tergite swollen basally but evenly rounded, finely punctured, with an obscure median raised line, the apical part narrowed, not upturned at tip; sixth sternite extending far beyond sixth tergite, long and narrow, not notched at sides, and not fringed.

MALE.—Length about 10 mm.; face and front densely covered with long, pure white hair; eyes black; second cubital cell receiving recurrent nervures equally distant from base and apex; front coxae with strong spines; tergites with white hair-bands, on fourth and fifth weak or failing in middle, but fifth and sixth with broad basal bands, narrowly interrupted in middle; fifth with a strong spine at each side; sixth with strong sharp lateral spines, and four apical ones, the upper pair rather short, and divergent; sixth segment short; the second tergite has a pair of linear transverse foveae, the surface behind and mesad of each fovea brilliantly polished; third sternite pale reddish at extreme base.

Colorado: vicinity of Boulder, reared by Mr. Chas. Hicks, from nests of *Megachile montivaga* Cresson. The exact localities are Owen's Lake, near Marshall and near Lake View.

Through some confusion that I cannot now explain, this was referred to *C. coloradensis* Cresson, which was based on a male with polished black tegulae, black legs with red tarsi, and differently ornamented abdomen. In Crawford's table the female goes exactly to *C. sculptifrons* Crawford, but is distinguished by the long axillar spines, conspicuous pubescence covering clypeus, and other characters. It is less robust than *C. deplanata* Cresson, and has the end of the female abdomen very much narrower. The hair on the eyes is much shorter than in *C. rufitarsis* Smith.

Ashmeadiella coloradensis, new species

MALE.—Length about 5 mm.; black, including mandibles, antennae (flagellum very faintly reddish beneath), eyes, tegulae, and apical teeth of abdomen; first tergite clear red, blackened at extreme base, and with a black stain at apical middle, second tergite broadly red at sides, third with a little red laterally; hind femora red, black at apex-above; hind tibiae red, with the hind margin and apex black, the margin with dense white hair; face and front entirely covered with long pure white hair; thorax with white hair, on mesopleura densely covering the surface; abdomen with conspicuous white hair-bands, on bases and apices of tergites; venter with broad bands of white hair; vertex dullish, very densely punctured; mesothorax finely and closely punctured, moderately shining on disc; scutellum shining; scutellar

region with long hair; extreme base of metathorax dull, but this is followed by a brilliantly shining band; hair on inner side of hind basitarsi pale orange; abdomen shining, with the usual four apical teeth, the middle pair short and broad, obtusely pyramidal in outline; stipites reddish, stout, strongly curved, covered with fine short pubescence. The maxillary palpi are very short. The wings are perfectly hyaline, and iridescent, the nervures very delicate, except that the intercubiti are stout. The second recurrent nervure reaches second cubital cell at a distance from base equal to a little over half of the length of first intercubitus.

From the same lot of nests, Mr. Hicks bred several specimens which had the tegument of legs and abdomen entirely black. It does not appear possible that these represent another species.

The species is nearest to *A. prosopidis* Cockerell, which is black, and distinctly smaller, with very slender abdominal bands. It may be only racially distinct, but I have no topotypical males of *A. prosopidis* to dissect.

From *A. wislizeni* Cockerell (male), *A. coloradensis* differs by being smaller, with the middle teeth of apex of abdomen obtusely pyramidal, instead of being like the end of a finger. A more easily noticed character for separation is the dense covering of white hair on mesopleura.

Colorado: Owen's Lake, near Boulder, bred in some numbers by Mr. Charles Hicks. He will later publish his observations.

Osmia mertensiae Cockerell

This was described (1907) from the male, taken at Florissant, Colorado. The female is olive green, with black ventral scopa; head large, with broad rounded cheeks; mandibles broad, with three teeth, the two outer sharp, the third broad and strongly emarginate, so that it may be regarded as two teeth; clypeus normal, dull and granular, the pubescence abundant, appearing white in lateral view, but gray and inconspicuous from the front; below the margin of the clypeus are two large tufts of orange hair; sides of face and supraclypeal area glistening; antennae black, the flagellum obscurely reddish beneath (not conspicuously red as in the male); vertex and middle of front with conspicuous long black hair, occiput with white hair; thorax with long silky white hairs, but mixed with long black hairs on disc (in the male these black hairs are wholly absent); base of metathorax glistening but not polished, golden green, contrasting with the blue-green of the parts immediately below; legs black; spurs black; hair on inner side of hind basitarsi chocolate color; abdomen shining, hind margins of tergites more golden green than the rest; first tergite with long silky white hair, but the apical middle tergites with very scanty black hair; sixth with some pale pubescence.

In my table in University of Colorado Studies, XVI (1928), the female runs to the vicinity of *O. olivacea* Cockerell, but it is considerably smaller, with more shining abdomen. On account of the smaller size, it can be run to *O. albolateralis* Cockerell, which lacks the large orange tufts below the clypeal margin, has conspicuous black hair at sides of clypeus, and is differently colored. In the Sandhouse key to Pacific coast species (1924, Proc. Calif. Acad. Sci., XIII) it runs out next to the blue-green *O. sedula* Sandhouse. In the Sandhouse key to Canadian species (1925, Canad. Entom., LVII), it runs nearest to *O. phaceliae* Cockerell, which is blue, with a much narrower abdomen.

O. mertensiae is widely distributed, and I expected to find that the female had been described under another name, but this is not the case. Both sexes were bred from the nest by Mr. Charles H. Hicks, April 18, 1934. The nests were found at Nederland, Colorado (alt. 8260 ft.), by the little son of Mr. W. O. Mitchell, who gave them to Mrs. Helen James.

Alcidamea helenae, new species

MALE.—Length about 7 mm.; resembles *A. mucronata* Ckll. in the fulvous hair of head and thorax above, but easily distinguished by the smaller size, the whiter hair of face (though it is not pure white, like that on lower part of mesopleura), the basal nervure falling a little short of intercubitus, the shorter apical spine of abdomen, and especially the produced and acute ventral spine. Structurally it is more like *A. producta* Cresson, but it is larger, with differently colored pubescence. The marginal cell is considerably longer and more slender than in a drawing of the wing of the type of *A. producta*, kindly made for me by Mr. E. T. Cresson, Jr.

Colorado: Gregory Canyon, Boulder, bred from a twig, May 5, 1934 (Helen James). From the same twig was bred a female parasite, *Stelis sexmaculata* Ashmead.